THE EXTENSION PATHOLOGIST

"To promote economic crop production, improve the quality of the products, and prevent wastage in storage, transit, and at the market."

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THE EXTENSION PATHOLOGIST

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PLAN OF WORK.

This is the time of year when the extension pathologist finds it necessary to complete his plans for activities during the coming crop season. Before the next month is over he must have allotted his time and effort for the year in such a way as to make sure that all of his projects will receive the necessary amount of time and attention to bring them to a successful conclusion.

At this point it may be helpful to study the undertaking as a whole, reviewing it from the time when the project in extension pathology first began in the State to the present. It is well, occasionally, to take time for reflection over progress of our work, questioning ourselves here and there with regard to past activities. Are we taking advantage of all possible means of getting the work done with dispatch and greatest profit to the community? Have we mapped our projects in advance, by months and by years, in order that as time goes on, stock can be taken with regard to progress? Do the records taken each year really serve as markers by means of which the status of the work can be judged?

It was with the idea of stimulating thought on matters of this sort that the secretary of the American Phytopathological Society, with the assistance of other members, prepared an outline to be used as a basis for discussion at the extension session of the annual meeting, Boston, December, 1922. At a recent conference of extension pathologists in Cincinnati, a request was made that this outline first be reprinted in our news sheet, and that in succeeding numbers space be given to short articles by our members and others, in which sections of the outline will be discussed from the standpoint of personal experience. This outline follows:

FACTORS ENTERING INTO METHODS OF ORGANIZING AND CONDUCTING EXTENSION WORK IN PLANT PATHOLOGY.

(Given a new man in a new field.)

A. Survey of disease problems for the State.

1. Important crops grown in the State.
2. Regions of intensive culture.
3. Most destructive diseases.
4. Distribution of these diseases.
5. Plant-disease Survey.

B. Selecting the extension problems for the State.

1. Distinction between a research problem and an extension problem.
2. When is a problem ready to be given to the extension pathologist?
3. Relative importance of crops and of diseases.
4. Effectiveness of control measures known.
5. Applicability to this State and to any or all sections.
6. Practicability of such measures.
7. Psychology of growers.

8. Relation of possible problems to available resources of extension department.
9. Responsibility of research pathologist.

C. Obtaining support for extension work.

1. At the college and experiment station.
2. From the county agents.
3. From the growers.
4. Relation to the United States Department of Agriculture.

D. Demonstrations and their place in extension work.

1. Purpose and nature of demonstrations.
2. Number to be provided - in the State, in the county.
3. Cooperators.
4. Labor and materials.
5. Layout of demonstrations, as to location, size, checks.
6. Relation to county agents.
7. Meetings and publicity when results are observable.
8. Photographs.

E. Measuring and recording results of demonstrations.

1. Importance.
2. Measure to be used.
3. Nature of records to be made.
4. Interpretation of these data.

F. Extending results of demonstrations.

1. Objects of publicity - in fall, giving results of year's demonstrations; and in spring, calling attention to losses due to disease and urging adoption of control measures.

2. Agencies.
   a. Publications, etc. - newspapers, county and local; farm papers; farm bureau papers; circulars; cards and letters; posters.
   b. Meetings - extension schools; association meetings; community meetings.
   c. Radio.
   d. Exhibits.

3. Cooperation of other agencies, such as railroads, bankers, merchants, manufacturers, and schools.

G. Continuing demonstrations after first year.

1. Determining factors.
2. Relation of extension pathologist and county agents to such continued demonstrations.
3. Comparison with demonstrations of previous years, in layout, etc.
4. Length of time campaign should be continued.
5. If demonstration of first year is unsuccessful, should another attempt be made or should problem be referred to research specialists?

H. Other extension methods and practices.

Though the above outline is incomplete in many respects, it at least contains some reminders of matters which the extension pathologist should consider in making up his plan of work. Now perhaps more than any other is the time to think these matters through, always having in mind the goal which is to be reached one, two, or perhaps five or ten years ahead.

Keep this outline where it may be referred to as a whole in the study of articles dealing with its several phases as they may be submitted from time to time. F. C. M.

CONCERNING EQUIPMENT

Among the many reasons which may be responsible for failure of farmers to adopt control measures that have been recommended, lack of proper equipment to carry on the work is perhaps the most common. Unless the type of machinery necessary, in order to make the measure a profitable one for the grower under his farming conditions, is available to the grower and is financially within his reach, our efforts at extension are likely to be wasted. It is, of course, a part of the work to study this matter and render assistance where necessary. Attention to this phase of the project is one of the secrets contributing to success in the case of Mr. Nixon's work on potato spraying in Pennsylvania, which was discussed in our last issue. The following note and illustrations received from Washington State give timely information concerning machines used for applying copper carbonate. (For details of the work done by Mr. Zundel during 1922 and 1923, which resulted in the treatment of wheat used for seeding more than 734,000 acres of wheat in 1923, see THE EXTENSION PATHOLOGIST, Vol. I, No. 1.) F. C. M.

MACHINES FOR APPLYING COPPER CARBONATE TO CEREALS

By George L. Zundel, Extension Pathologist,
State College of Washington.

As soon as it had been demonstrated that copper-carbonate dust would effectively control smut under Washington conditions, our next problem was to perfect a machine so that the powder could be applied quickly to a large amount of wheat.

A little experimentation showed that the rotary type of machine was best for this work. Accordingly the Washington Experiment Station devised a rotary machine that could be built by any farmer. This machine is 5½ feet high and consists essentially of (1) a wooden frame for support; (2) a cylindrical drum 21 inches in diameter and 36 inches long; and (3) a shaft passing end to end through the middle of the drum with a cogwheel on the outside at one end, which connects with another cogwheel attached to a crank.

The ratio of the cogs on the drum wheel and the cog attached to the crank is one to four; (4) three buffer mixers within the drum; (5) a slide door cut through the curved surface of the drum, by means of which access may be had to the inside. (For more details, write for Washington Experiment Station Bulletin No. 163.)

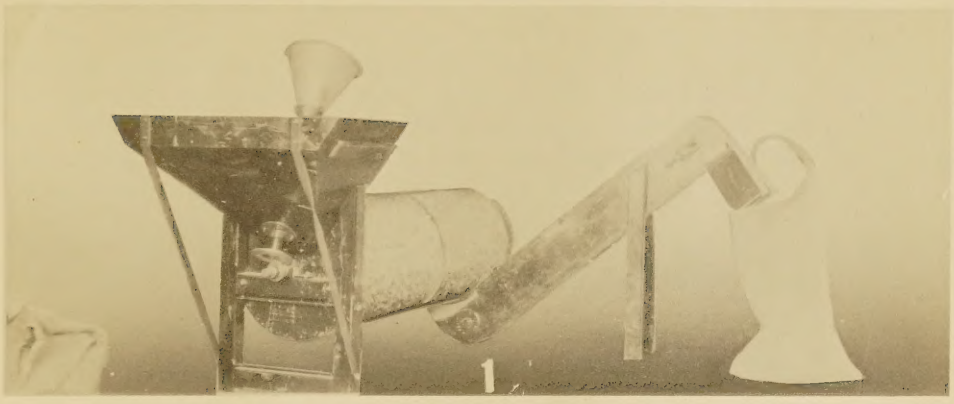
The machine described above is operated by hand, and will treat 1½ bushels of wheat every three minutes.

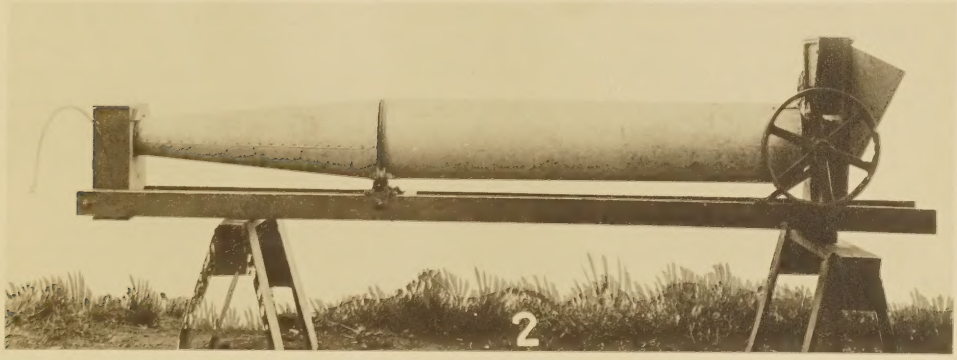
As soon as there was evidence of a demand for this machine, two or three machine companies in the State started to make them. From the modifications made by these companies the State-college treating machine soon evolved into the three excellent commercial machines which are now manufactured at Walla Walla, Ritzville, and Spokane. All of the commercial machines are power-driven, have a continuous feed for copper carbonate, and are capable of treating 100 to 250 bushels per hour.

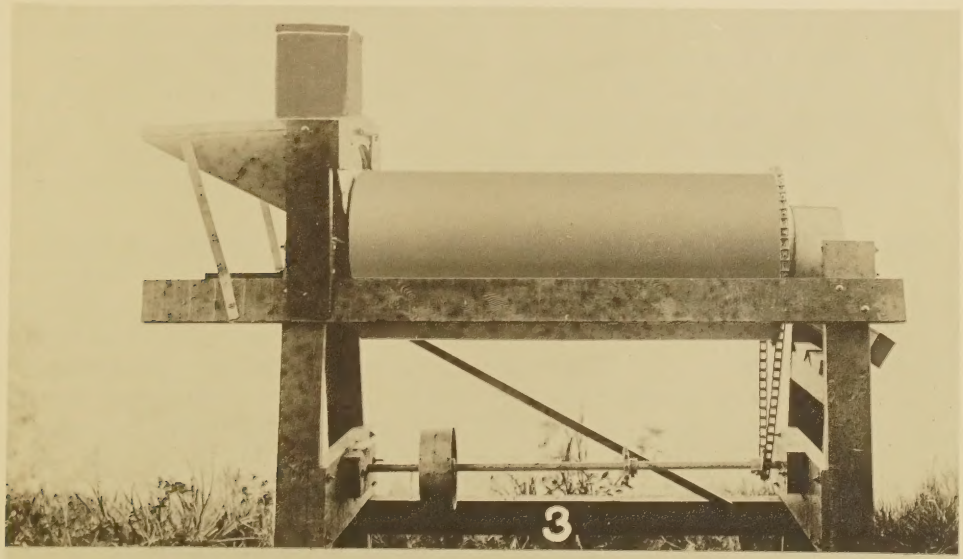
A very good type of homemade machine frequently used consists of a cubical box of any desired size, with a shaft extending diagonally from one corner to another and mounted on a frame. A door is built at one corner, and the machine is turned by hand. An example of this is seen in Fig. 3, page 15.

Our first method of applying copper carbonate was with the shovel; however, to get the best control of smut, it is necessary for the application to be made in a machine.

NOTE: On page 15 will be found photographs of four types of homemade machines that have been used by Washington State farmers. The next page carries illustrations of the three commercial types mentioned above. If photographs of the State machine described by Mr. Zundel are desired, we can supply a few workers with these on request. F. C. M.







Three types of commercial machines used for copper carbonate treatment of wheat seed in Washington State.

CONCERNING CUCUMBER SPRAYING

Owing to the growing importance of the cucumber crop in the Southern States, and its susceptibility to downy mildew, angular leaf-spot, and anthracnose, southern extension pathologists will be particularly interested in the work done by Doctor Moore in South Carolina during 1923. Cucurbit spraying throughout the South, particularly of watermelons, lends itself to the spray-ring idea. The methods used in the potato-spray work described in Vol. 2, No. 1, are worthy of study in this connection. F. C. M.

CUCUMBER SPRAYING IN SOUTH CAROLINA

By W. D. Moore, Extension Pathologist,
Clemson Agricultural College of South Carolina.

Importance of crop. - The growing of cucumbers in South Carolina has been confined until recently to a very small area in the Savannah River Valley southeast of Augusta, Ga. The territory is rapidly spreading now, and large fields are being planted along the coast, particularly in Charleston County. Although the area planted is still small, the South Carolina cucumber crop was valued at $970,000 in 1923.

Cultural practices. - Cucumber growing received its impetus from the advent of the boll weevil and the subsequent decline in production per acre of cotton. Individual farmers took up the growing of cucumbers on a large scale, and devoted all their attention to proper fertilization and cultivation, overlooking the possibility of losses from plant diseases. Prior to 1923, although some farmers treated their seed, no spraying was attempted. This failure to spray naturally resulted in a yearly increase of disease infection in the fields which were grown to cucumbers during successive seasons. The particular section of the State in which cucumbers are grown has a heavy annual rainfall, with a very high humidity during the spring months, conditions which favor foliage diseases. Consequently, within a short period of years the cucumber industry was threatened with total destruction under the original system of culture.

Spraying work. - In May, 1923, the writer visited the cucumber district and proposed to the leading growers a program of spraying that he believed would control their trouble - mildew caused by Pseudoperonospora cubensis (B&C) Rostow. As it was understood locally that the trouble was entirely due to heavy rainfall, and consequently beyond control, it was difficult to arouse interest. When the matter was explained to them, three farmers agreed to furnish the land and spray materials for a demonstration; a barrel spray pump was borrowed and the work started.

In the center of each of three large fields, plots 200 feet long and 16 rows wide were staked off, thus exposing the sprayed rows to the main field on all sides. The first four rows were sprayed, the second four retained as a check, and the last four sprayed. Bordeaux mixture was used in all cases. The first spray, a 3-4-50 mixture, was applied when the vines first began to run. The second spray, a 4-4-50 mixture, was put on 14 days later. The original plan called for a spray every 10 days until picking started, but excessive rains prevented other sprays from being made.

Results. - Harvest was started on June 2 and was concluded June 18. On the day of the last picking, when vines in the unsprayed sections of the fields were blighted down and carried no fruit, the sprayed plants were green and showed a heavy setting of cucumbers. During the actual picking period, the sprayed rows in one plot produced 684 pounds of cucumbers, as compared to 571 pounds on the unsprayed rows. The other plots showed an equal addition in yield in favor of the spray. Picking was not continued on the sprayed rows, due to the planting of a cover crop, although the vines were still bearing.

As a result of this work, every grower will spray this year. The large acreages will be sprayed with power machines. A 3-4-50 Bordeaux mixture will be applied when the vines first begin to run, and will be followed by sprays of 4-4-50 concentration, applied at 10-day intervals.

HAVE YOU A QUESTION?

The suggestion has been made that we devote a section to questions and answers related to different matters presented by contributors. Believing that this might tend to bring out the kind of information concerning extension methods in which our readers are most interested, we intend to give the plan a trial. If you have a question concerning the work outlined in this number, please send it in to THE EXTENSION PATHOLOGIST. All questions received will be referred to the author of the article which inspired them, and opportunity will be given him in an early issue to discuss the subject on which information has been requested.

"HIDDEN FOES IN SEED POTATOES"

A one-reel motion picture, entitled "Hidden Foes in Seed Potatoes," was recently completed by the department, and is now ready for use by extension workers. In this film, which was prepared in cooperation with extension pathologists in New York State and New Jersey, an effort is made to call the attention of farmers to the desirability of planting seed potatoes which are free from such diseases as mosaic, spindling-tuber, and leaf-roll. Attention is called to the fact that freedom of seed stocks from these diseases must be determined by examination of plants in the seed field during the growing season.

Requests for use of this film should be directed to Office of Motion Pictures, United States Department of Agriculture, Washington, D. C.

EXTENSION LITERATURE

During the December meeting of the American Phytopathological Society in Cincinnati, an informal conference of the majority of extension workers present was held for the purpose of discussing policies to be followed in the development of our news sheet. It was suggested at that time that it would be helpful if current extension literature on pathological subjects by the States could be listed in each issue. Those present volunteered to send in recent publications and to place the writer's name on the mailing list for all such material issued in the future. The material will be filed in the office of THE EXTENSION PATHOLOGIST, and citations will be made in THE EXTENSION PATHOLOGIST of papers received. During the past month the following literature has reached this office:

Iowa:

Porter, R. H., Potato diseases and their control. Iowa State Col. Agri. Ext. Bul. 83; 15 p. illus. April, 1921.

_____Canada thistle and quack-grass eradication. Iowa State Col. Agri. Bul. 113; 4 p. illus. April, 1923.

_____ Dry rot of corn and its control. Iowa State Col. Agri. Ext. Bul. 114; 3 p. illus. Sept., 1923.

Kentucky:

Valleau, W. D., The control of angular leaf-spot and wildfire of tobacco. Kentucky Col. of Agri. Ext. Div., Circ. 162; 4 p. Dec., 1923.

Maryland:

Jehle, R. A., Insure your tobacco crop against wildfire. Maryland Univ. Ext. Serv., Information card 7, rev; 1 p. Feb., 1924.

Spray schedules for 1924. Maryland Univ. Ext. Serv., Information card 9; 3 p. Jan., 1924.

North Carolina:

Monthly hints to fruit growers. January, 1924. N. C. State Col. Agri. Ext. Service. 4 p. (Mimeographed)

Vermont:

Gilbert, A. H., Spindling-tuber, a new potato disease. Vermont Col. of Agri. Ext. Serv. Circ. 28; 4 p. illus. Oct., 1923.

Washington:

Zundel, G. L., Problems in plant diseases. In Agriculture in Washington as analyzed by extension service specialists; p. 21-22. Wash. State Col. Ext. Serv. Nov., 1923.

_____Harvesting and storing potatoes to prevent disease. Wash. State Col. Ext. Serv. [Bul.] 111; 11 p. illus. Jan., 1924.

West Virginia:

Spray service information to fruit growers. West Virginia Col. of Agri. [Notice 1] - 6; 1 p. each. April 5, 12, 18, May 1, 11, 25, 1923.

Contributions or suggestions with regard to subjects that might be profitably discussed in this news sheet should be addressed to Fred C. Meier, Extension Pathologist,, United States Department of Agriculture, Washington, D. C.